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Implementing The Tracking Network

poster ABSTRACT

Poster No. 15

TITLE
QUANTIFYING GEOCODE LOCATION ERROR USING GIS METHODS

TRACK
Network Content

OBJECTIVES
Our objectives are to communicate an efficient, GIS-based method for quantifying uncertainty in residential geocodes and to present results from our application of this method to geocoded birth defects surveillance data in Atlanta.

SUMMARY
Introduction: The Metropolitan Atlanta Congenital Defects Program (MACDP) collects maternal address information at the time of delivery for infants and fetuses with birth defects. These addresses have been geocoded by two independent agencies: (1) the Georgia Division of Public Health Office of Health Information and Policy (OHIP) and (2) a commercial vendor. Geographic information systems (GIS) methods were used to quantify uncertainty in the two sets of geocodes using orthoimagery and tax parcel datasets.

Methods: The addresses for a random sample of 599 infants with birth defects delivered during 1994–2002 with maternal residence in either Fulton or Gwinnett County were selected for validation. Tax parcel datasets were obtained from the tax assessor's offices of Fulton and Gwinnett County. High-resolution orthoimagery for these counties was acquired from the U.S. Geological Survey. For each of the 599 addresses we attempted to locate the tax parcel corresponding to the maternal address. If the tax parcel was identified the distance and the angle between the geocode and the residence were calculated.

Results: Median location error was less than 100 meters for both OHIP and commercial vendor geocodes; the distribution of angles appeared uniform. Less than 1% of geocodes had location error greater than 1 kilometer.

Conclusions: Geocode location uncertainty can be estimated using tax parcel databases in a GIS. This approach is a viable alternative to global positioning system field validation of geocodes. Advantages and disadvantages of using tax parcel data for geocoding addresses are discussed.

AUTHOR(S):
Matthew J Strickland, M.A., M.P.H.
National Center on Birth Defects and Developmental Disabilities (NCBDDD), CDC

Csaba Siffel, NCBDDD, CDC
Bennett R. Gardner, NCBDDD, CDC
Alissa K. Berzen, ATSDR, CDC
Adolfo Correa, NCBDDD, CDC

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